

08/10/00

US 902 U.S. PTO

**UTILITY PATENT APPLICATION TRANSMITTAL
(Small Entity)***(Only for new nonprovisional applications under 37 CFR 1.53(b))*Docket No.
CREO.004US0Total Pages in this Submission
29**TO THE ASSISTANT COMMISSIONER FOR PATENTS****Box Patent Application
Washington, D.C. 20231**

Transmitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

**METHOD AND APPARATUS IMPLEMENTED IN A FIREWALL FOR COMMUNICATING INFORMATION
BETWEEN PROGRAMS EMPLOYING DIFFERENT PROTOCOLS**US 902 U.S. PTO
09/636135

08/10/00

and invented by:

Gu, Ke-Qin; Chen, Tsung-Yen (Eric); Han, Ching-Chih (Jason); and Lee, Kuo-Chun.If a **CONTINUATION APPLICATION**, check appropriate box and supply the requisite information:☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____

Which is a:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____

Which is a:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____

Enclosed are:

Application Elements

1. ☒ Filing fee as calculated and transmitted as described below
2. ☒ Specification having 13 pages and including the following:
 - a. ☒ Descriptive Title of the Invention
 - b. ☐ Cross References to Related Applications *(if applicable)*
 - c. ☐ Statement Regarding Federally-sponsored Research/Development *(if applicable)*
 - d. ☐ Reference to Microfiche Appendix *(if applicable)*
 - e. ☒ Background of the Invention
 - f. ☒ Brief Summary of the Invention
 - g. ☒ Brief Description of the Drawings *(if drawings filed)*
 - h. ☒ Detailed Description
 - i. ☒ Claim(s) as Classified Below
 - j. ☒ Abstract of the Disclosure

UTILITY PATENT APPLICATION TRANSMITTAL
(Small Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.
CREO.004US0

Total Pages in this Submission
29

Application Elements (Continued)

3. ☒ Drawing(s) *(when necessary as prescribed by 35 USC 113)*
a. ☒ Formal b. ☐ Informal Number of Sheets 3
4. ☒ Oath or Declaration
a. ☒ Newly executed *(original or copy)* ☐ Unexecuted
b. ☐ Copy from a prior application (37 CFR 1.63(d)) *(for continuation/divisional application only)*
c. ☒ With Power of Attorney ☐ Without Power of Attorney
d. ☐ DELETION OF INVENTOR(S)
Signed statement attached deleting inventor(s) named in the prior application,
see 37 C.F.R. 1.63(d)(2) and 1.33(b).
5. ☐ Incorporation By Reference *(usable if Box 4b is checked)*
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under
Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby
incorporated by reference therein.
6. ☐ Computer Program in Microfiche
7. ☐ Genetic Sequence Submission *(if applicable, all must be included)*
a. ☐ Paper Copy
b. ☐ Computer Readable Copy
c. ☐ Statement Verifying Identical Paper and Computer Readable Copy

Accompanying Application Parts

8. ☒ Assignment Papers *(cover sheet & documents)*
9. ☐ 37 CFR 3.73(b) Statement *(when there is an assignee)*
10. ☐ English Translation Document *(if applicable)*
11. ☐ Information Disclosure Statement/PTO-1449 ☐ Copies of IDS Citations
12. ☐ Preliminary Amendment
13. ☒ Acknowledgment postcard
14. ☒ Certificate of Mailing
☐ First Class ☒ Express Mail *(Specify Label No.):* EK847722780US

UTILITY PATENT APPLICATION TRANSMITTAL (Small Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.
CREO.004US0

Total Pages in this Submission
29

Accompanying Application Parts (Continued)

15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed)

16. ☒ Small Entity Statement(s) - Specify Number of Statements Submitted: 1

17. ☐ Additional Enclosures (please identify below):

Fee Calculation and Transmittal

CLAIMS AS FILED

For	#Filed	#Allowed	#Extra	Rate	Fee
Total Claims	20	- 20 =	0	x \$9.00	\$0.00
Indep. Claims	3	- 3 =	0	x \$39.00	\$0.00
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>					\$0.00
BASIC FEE					\$345.00
OTHER FEE (specify purpose)					\$0.00
TOTAL FILING FEE					\$345.00

- ☒ A check in the amount of \$345.00 to cover the filing fee is enclosed.
- ☐ The Commissioner is hereby authorized to charge and credit Deposit Account No. _____ as described below. A duplicate copy of this sheet is enclosed.
- ☐ Charge the amount of _____ as filing fee.
 - ☐ Credit any overpayment.
 - ☐ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.
 - ☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).

Dated: August 10, 2000


Signature

cc:

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) AND 1.27 (c)) - SMALL BUSINESS CONCERN

Docket No.
CREO.004US0

Serial No.

Filing Date

Patent No.

Issue Date

Applicant/

Patentee: **Gu, Ke-Qin; Chen, Tsung-Yen (Eric); Han, Ching-Chih (Jason); and Lee, Kuo-Chun**

Invention:

METHOD AND APPARATUS IMPLEMENTED IN A FIREWALL FOR COMMUNICATING INFORMATION BETWEEN PROGRAMS EMPLOYING DIFFERENT PROTOCOLS

I hereby declare that I am:

- ☐ the owner of the small business concern identified below:
☒ an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN: **CreOsSys Inc.**ADDRESS OF CONCERN: **39560 Stevenson Pl., Suite 221, Fremont CA 94539**

I hereby declare that the above-identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the above identified invention described in:

- ☒ the specification filed herewith with title as listed above.
☐ the application identified above.
☐ the patent identified above.

If the rights held by the above-identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed on the next page and no rights to the invention are held by any person, other than the inventor, who could not qualify as an independent inventor under 37 CFR 1.9(c) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- ☒ no such person, concern or organization exists.
☐ each such person, concern or organization is listed below.

FULL NAME
ADDRESS

☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

FULL NAME
ADDRESS

☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

FULL NAME
ADDRESS

☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

FULL NAME
ADDRESS

☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING:

Kuo-Chun Lee

TITLE OF PERSON SIGNING

OTHER THAN OWNER:

President

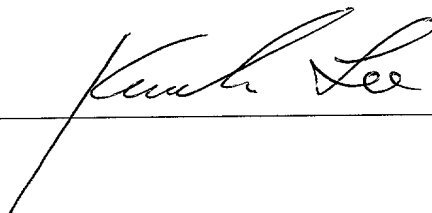
ADDRESS OF PERSON SIGNING:

CreOsys Inc.

39560 Stevenson Pl., Suite 221

Fremont, CA 94539

SIGNATURE:



DATE:

8/9/2000

CERTIFICATE OF MAILING BY "EXPRESS MAIL" (37 CFR 1.10)Applicant(s): **Gu, Ke-Qin et al.**

Docket No.

CREO.004US0

Serial No.

Filing Date

Examiner

Group Art Unit

Invention:

**METHOD AND APPARATUS IMPLEMENTED IN A FIREWALL FOR COMMUNICATING INFORMATION
BETWEEN PROGRAMS EMPLOYING DIFFERENT PROTOCOLS**JC841 U.S. P10
09/636135
08/10/00I hereby certify that this **APPLICATION FOR UNITED STATES PATENT**
(Identify type of correspondence)is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under
37 CFR 1.10 in an envelope addressed to: The Assistant Commissioner for Patents, Washington, D.C. 20231 on
August 10, 2000
(Date)**June Shin**

(Typed or Printed Name of Person Mailing Correspondence)

(Signature of Person Mailing Correspondence)

EK847722780US

("Express Mail" Mailing Label Number)

Note: Each paper must have its own certificate of mailing.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
APPLICATION FOR PATENT

**METHOD AND APPARATUS IMPLEMENTED IN A FIREWALL FOR
COMMUNICATING INFORMATION BETWEEN PROGRAMS EMPLOYING
DIFFERENT PROTOCOLS**

Inventors: Ke-qin Gu,
Tsung-Yen (Eric) Chen,
Ching-Chih (Jason) Han, and
Kuo-Chun Lee

FIELD OF THE INVENTION

The present invention generally relates to methods and apparatuses for communicating information between programs and in particular, to a method and apparatus implemented in a firewall for communicating information between programs employing different protocols.

BACKGROUND OF THE INVENTION

In many applications it is useful for programs to communicate information to each other. When the programs employ different protocols, however, such communication cannot occur directly. Protocol translation of the information is first necessary in order for a program to correctly interpret the information transmitted by another program employing a different protocol.

One such application involves communications over the Internet. With the growing popularity of the Internet, there is a growing demand by certain users to drive tools through the Internet, instead of only browsing the Internet. In particular, these users desire to access and use remotely located, real-time interactive software through the Internet. In many cases, this kind of activity requires a

persistent connection using a socket-based protocol, since such real-time interactive software were generally developed to run over a local area network ("LAN").

On the other hand, the HyperText Transfer Protocol ("HTTP") is the pervasive protocol of the World Wide Web. HTTP is a stateless protocol, because each command is executed independently, without knowledge of the commands that came before it. HTTP uses a request-response mechanism that is suitable for web browsing. HTTP, however, is different than many socket-based protocols in both format and handling procedure, thus making HTTP less than ideal for directly driving another program over the Internet.

Firewalls add further complications since they generally prevent direct and persistent connections to programs behind the firewall. Therefore, even though firewalls support HTTP communications through the Internet, driving an interactive real-time program behind a firewall is not straightforward. Modifying the interactive real-time programs to accommodate such communication is also generally impractical, because of the large number and complexity of such legacy programs.

OBJECTS AND SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a method and apparatus for communicating information between programs employing different protocols.

Another object is to provide a method and apparatus for communicating information over the Internet and through a firewall between programs employing different protocols.

Still another object is to provide a method and apparatus for communicating information over the Internet and through a firewall to a program requiring a persistent connection behind the firewall.

5 These and additional objects are accomplished by the various aspects of the present invention, wherein briefly stated, one aspect of the invention is a method implemented in a firewall (e.g., 100) for communicating information between programs employing different protocols
10 (e.g., 16 and 54), comprising communicating information between the programs by protocol translating the information between the different protocols.

 In another aspect of the invention, a method implemented in a firewall (e.g., 100) for communicating
15 information between a first program employing a first application level protocol (e.g., 16) in front of the firewall, and a second program employing a persistent application level protocol (e.g., 54) behind the firewall, comprises: establishing a persistent connection with the
20 second program; and communicating information between the first program and the second program by protocol translating the information between the first application level protocol and the persistent application level protocol.

 In yet another aspect of the invention, an
25 apparatus in a firewall (e.g., 100) for communicating information between a first program employing a first application level protocol (e.g., 16) in front of the firewall, and a second program employing a persistent application level protocol (e.g., 54) behind the firewall,
30 comprising a bastion host (e.g., 30) having a protocol proxy (e.g., 34) for establishing a persistent connection between the protocol proxy and the second program, and communicating

information between the first program and the second program by protocol translating the information between the first application level protocol and the persistent application level protocol.

5 Additional objects, features and advantages of the various aspects of the present invention will become apparent from the following description of its preferred embodiments, which description should be taken in conjunction with the accompanying drawings.

10

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates a block diagram of a system including an apparatus implemented in a firewall for communicating information between programs employing
15 different protocols.

FIG. 2 illustrates a web page displayed on a web client to facilitate a method implemented in a firewall for communicating information between programs employing different protocols.

20 **FIG. 3** illustrates a flow diagram of a method implemented in a firewall for communicating information between programs employing different protocols.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

25 **FIG. 1** illustrates a diagram of a computer system including: a web client **10** having a web browser **12**, a web page **14**, and a java applet **16** residing on it; a bastion host **30** having a packet filter **32** and a protocol proxy **34** residing on it; and a host or web server **50** having an
30 application program **52** and a special window manager **54** residing on it. All communications between the protocol

proxy **34** and the application program **52** go through the special window manager **54**. The web client **10** communicates with the bastion host **30** through the Internet **20**, and the bastion host **30** communicates with the host server **50** through a LAN **40**. The bastion host **30** and the packet filter **32** combine in a conventional manner to form a firewall **100** that protects the host server **50** from hacker attacks launched through the Internet **20**. The web page **14** and the java applet **16** had been previously downloaded from the host server **50**.

FIG. 2 illustrates the web page **14** as it appears on a display screen of the web client **10**. A menu area **201** is reserved for control buttons such as, for example, buttons **202**, **203** and **204**, that generate commands through the java applet **16** which control the operation of the application program **52** through the special window manager **54**. An image area **205** is reserved for images received from the application program **52** through the special window manager **54**. Preferably, the web page **14** resembles the display screen on the host server **50** when running the application program **52**, including the location and functions of the control buttons. Although control buttons are used in this example, their use is merely to simplify the description. It is to be appreciated that tool bars with pull-down menus are more commonly used in practice and fully contemplated within the scope of the present invention.

The application program **52** is a real-time interactive program employing a corresponding socket-based protocol. The special window manager **54** is preferably VNC (virtual network computing) from AT&T employing the RFB (remote frame buffer) protocol. Both protocols require a

persistent connection. As will be described in reference to **FIG. 3**, the protocol proxy **34** translates information to be communicated from the java applet **16** to the application program **52** through the VNC program **54** from HTTP to the RFB protocol. Conversely, the protocol proxy **34** translates return information from the application program **52** through the VNC program **54** to the java applet **16** from the RFB protocol to HTTP.

FIG. 3 illustrates a flow diagram of a method implemented in the firewall **100** for communicating information between programs employing different protocols. Protocol proxy **34** primarily performs the method. In **301**, the protocol proxy **34** receives information from the client server **10** after the information has successfully passed through the packet filter **32**. The information may be in the form of a command or a request for information from the java applet **16** to the application program **52** through the VNC program **54**. In order to be routed properly, the information is addressed to the protocol proxy **34** with final destination of the VNC program **54** designated in the header. The destination or target program is designated by the java applet **16** when the web client user clicks on a button in the menu area **201** of the web page **14**.

In **302**, the protocol proxy **34** reads the final destination of the information (i.e., the target program) and determines whether the received information is the first information to be communicated to that destination in the current session. The determination is straightforward. If there is no socket currently open with the destination, then the received information is assumed to be the first information to be communicated to that destination in the current session, and the answer is yes. On the other hand,

if there is an open socket currently open with the destination, then the received information is assumed not to be the first information to be communicated to that destination in the current session, and the answer is no.

5 Now, if the answer in **302** is yes, then in **303**, the protocol proxy **34** first opens a socket with the target program (i.e., the VNC program **54**). In **304**, the protocol proxy **34** translates the information from HTTP to the RFB protocol. As used herein, protocol translation means any or
10 all of providing the proper handshaking, format (e.g., headers, command, data, and error correction code), and command or data translation, as appropriate. Also, both the application program's persistent connection, socket-based protocol and the VNC program's RFB protocol are referred to
15 herein as persistent application level protocols.

 In **305**, the protocol proxy **34** communicates the protocol translated information to the destination or target program. The proxy protocol **34** may then loop back to **301** to receive another information from the java applet **16**, or
20 proceed to **306**. In **306**, the protocol proxy **34** receives a response from the target program, and in **307**, the protocol proxy **34** then translates the information from the RFB protocol to HTTP. In **308**, the protocol proxy **34** then communicates the protocol translated information to the java
25 applet **16**. The protocol proxy **34** may then loop back to **301** if it receives an information packet from the java applet **16**, or loop back to **306** if it receives an information packet from the application program **52** through the VNC program **54**.

 On the other hand, if the answer in **302** is no,
30 then the protocol proxy **34** skips **303** and performs **304-308** as previously described. After the web client user terminates

his or her session, the java applet **16** sends a termination indication to the protocol proxy **34**, and the protocol proxy **34** closes the open socket with the VNC program **54**. Thus, by maintaining the socket open in this fashion with the VNC
5 program **54** until told to quit or terminate, a persistent connection is established and maintained with the program.

Although the various aspects of the present invention have been described with respect to a preferred embodiment, it will be understood that the invention is
10 entitled to full protection within the full scope of the appended claims.

CLAIMS

We claim:

1. A method implemented in a firewall for communicating information between programs employing different protocols, comprising communicating information between the programs by protocol translating the information between the different protocols.

2. The method according to claim 1, wherein one of the programs is in front of the firewall employing a stateless application level protocol, and another of the programs is behind the firewall employing a persistent application level protocol.

3. The method according to claim 2, further comprising establishing a persistent connection with the program behind the firewall before communicating information between the programs.

4. The method according to claim 3, further comprising communicating with the program in front of the firewall over the Internet, and communicating with the program behind the firewall over a local area network.

5. The method according to claim 4, wherein the program in front of the firewall resides on a client server.

6. The method according to claim 4, wherein the program behind the firewall resides on a web server protected by the firewall.

7. A method implemented in a firewall for communicating information between a first program employing a first application level protocol in front of the firewall, and a second program employing a persistent application level protocol behind the firewall, comprising:

establishing a persistent connection with the second program; and

communicating information between the first program and the second program by protocol translating the information between the first application level protocol and the persistent application level protocol.

8. The method according to claim 7, wherein the first application level protocol is a stateless application level protocol.

9. The method according to claim 8, wherein the stateless application level protocol is hypertext transfer protocol.

10. The method according to claim 7, wherein the persistent application level protocol is remote frame buffer protocol.

11. The method according to claim 7, wherein the establishing a persistent connection comprises opening a socket with the second program, and maintaining the socket open until communication between the first program and the second program terminates.

12. The method according to claim 7, further comprising receiving a request for information over the

Internet from the first program directed to the second program, before establishing the persistent connection with the second program.

13. The method according to claim 7, further comprising receiving a request for information from the second program directed to the first program, after establishing the persistent connection with the second program.

14. An apparatus in a firewall for communicating information between a first program employing a first application level protocol in front of the firewall, and a second program employing a persistent application level protocol behind the firewall, comprising a bastion host having a protocol proxy for establishing a persistent connection between the protocol proxy and the second program, and communicating information between the first program and the second program by protocol translating the information between the first application level protocol and the persistent application level protocol.

15. The apparatus according to claim 14, wherein the first application level protocol is a stateless application level protocol.

16. The apparatus according to claim 15, wherein the stateless application level protocol is hypertext transfer protocol.

17. The apparatus according to claim 14, wherein the persistent application level protocol is remote frame buffer protocol.

18. The apparatus according to claim 14, wherein the establishing a persistent connection comprises opening a socket with the second program, and maintaining the socket open until communication between the first program and the second program terminates.

19. The apparatus according to claim 14, wherein said bastion host further includes a packet filter, and said protocol proxy is further for cooperating with the packet filter to receive a request for information over the Internet from the first program directed to the second program, before establishing the persistent connection with the second program.

20. The apparatus according to claim 14, wherein said protocol proxy is further for receiving a request for information from the second program directed to the first program, after establishing the persistent connection with the second program.

ABSTRACT OF THE DISCLOSURE

A computer system includes a web client having a client based program residing on it, a firewall having a protocol proxy residing on it, and a host server having an application program and a special window manager residing on it. All communications between the protocol proxy and the application program go through the special window manager. The web client communicates with the firewall through the Internet, and the firewall communicates with the host server through a LAN. The client based program employs HTTP, and the special window manager employs a persistent connection, socket-based protocol. The protocol proxy establishes and maintains a persistent connection with the special window manager, and communicates information back and forth between the client based program and the application program through the special window manager by first protocol translating the information between HTTP and the special window manager's persistent connection, socket-based protocol.

FIG. 1 is a block diagram of a system 100 for providing a secure environment for executing a program. The system 100 includes a Web Client 10, a Web Browser 12, a Web Page 14, and a Java Applet 16. The Web Client 10 is connected to the Web Browser 12, which is connected to the Web Page 14, which is connected to the Java Applet 16. The Java Applet 16 is connected to a Host Server 50 via a LAN 40. The Host Server 50 includes an Application Program 52 and a VNC Program 54. The Host Server 50 is also connected to a Bastion Host 30 via the Internet 20. The Bastion Host 30 includes a Packet Filter 32 and a Protocol Proxy 34.

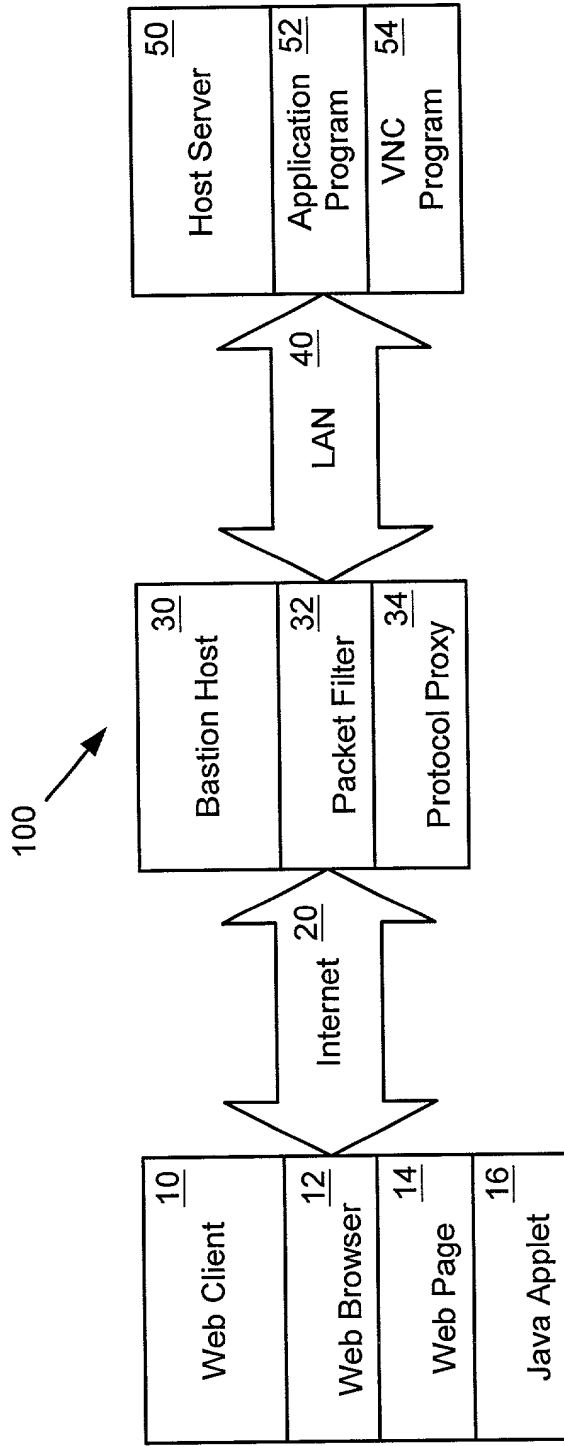


FIG.1

14

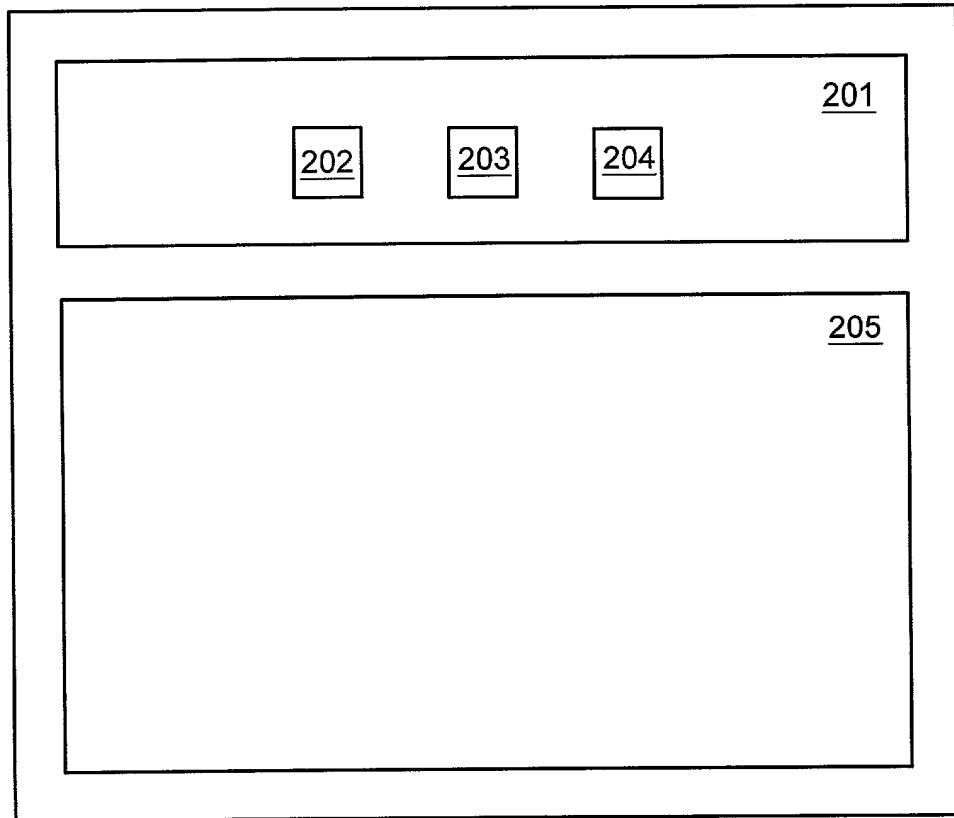


FIG.2

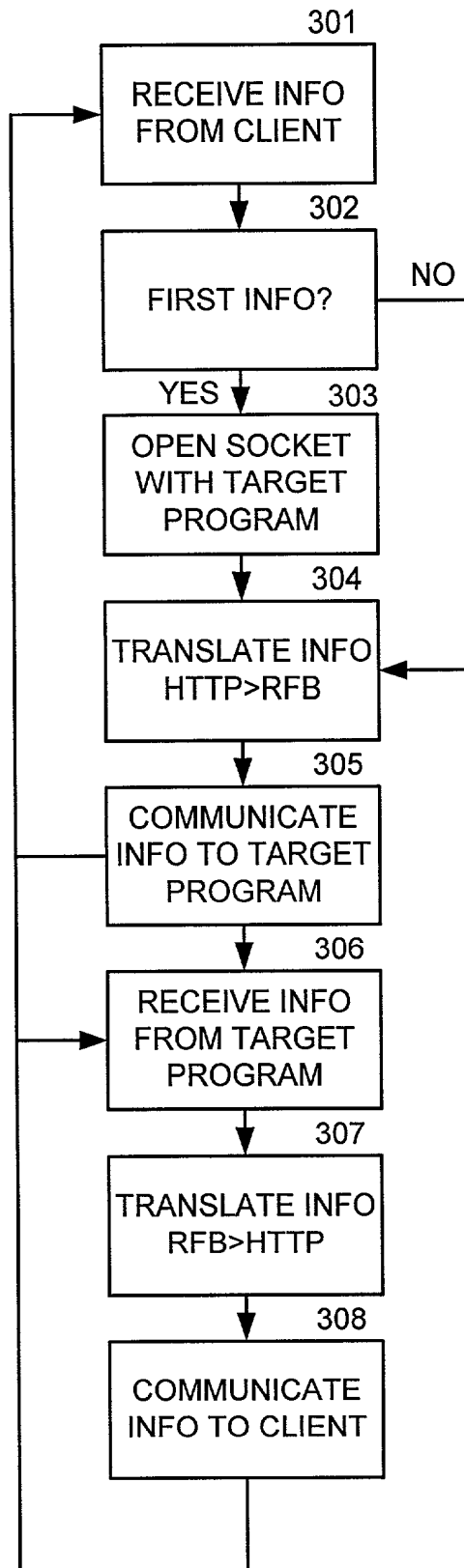


FIG.3

Docket No.
CREO.004US0

Declaration and Power of Attorney For Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

**METHOD AND APPARATUS IMPLEMENTED IN A FIREWALL FOR COMMUNICATING
INFORMATION BETWEEN PROGRAMS EMPLOYING DIFFERENT PROTOCOLS**

the specification of which

(check one)

☒ is attached hereto.

☐ was filed on _____ as United States Application No. or PCT International
Application Number _____
and was amended on _____
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

Priority Not Claimed

_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/>
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/>
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/>

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

I hereby claim the benefit under 35 U. S. C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C. F. R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

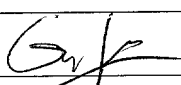
POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. *(list name and registration number)*

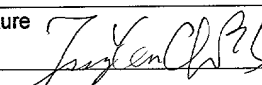
Victor H. Okumoto

35,973

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